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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/764,978 | 01/23/2004 | Plamen Denchev | 205502-9037 | 9303 |

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| EXAMINER | |
|---|---|
| HWU, JUNE | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1661 | |

DATE MAILED: 03/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/764,978 | DENCHEV ET AL. | |
| | Examiner | Art Unit | |
| | June Hwu | 1661 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *27 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,4-14,16-23,26-34 and 36-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-14,16-23,26-34 and 36-45* is/are rejected.

7)☒ Claim(s) *39* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

1. The amendment filed December 27, 2005 is acknowledged and entered.

2. The Office action mailed on September 26, 2005 is being replaced with the following Office action. Any rejection not repeated herein is hereby withdrawn.

### *Status of the Claims*

3. Claims 2-3, 15, 24-25, and 35 have been canceled. Claims 1, 4-14, 16-23, 26-34, and 36-45 are examined.

### *Claim Objections*

4. The claims are objected to because of the following informalities:

In claim 39, line 1, a comma should be inserted before "wherein". Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1, 4-14, 16-23, 26-34, and 36-45 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The starting material is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Dependent claims are included in all rejections.

Claim 1 and 23 are broadly drawn to a method of reproducing any conifers by any method of somatic embryogenesis by culturing any starting material under unspecified growing condition.

The instant specification describes the starting material as megagametophyes of immature zygotic embryos (page 10), which is essential to the claimed invention. Then describes the induction, proliferation and prematuration steps for Loblolly pine, Radiata pine and Douglas fir (pages 14-25). There is no guidance for the reproduction of conifers through somatic embryogenesis in the instant claims.

Therefore, given the lack essential information relative to the process of reproducing somatic embryos of the claimed methods, the claims are not enabled by the disclosure.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1, 4-14, 16-23, 26-34, and 36-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Dependent claims are included in all rejections.

7. Claims 1 and 23 are indefinite because they fail to recite any active, positive method steps delimiting how reproduction of conifers are actually practiced. The claims are incomplete and unclear because there are no procedures for somatic embryogenesis in conifers.

8. Claims 5, 20, 21, 27 and 41 are indefinite in their recitation of "about", since this is a relative term. It is unclear how much sugar is in the nutrient medium.

9. Claims 18 and 38 are indefinite in their recitation of "about", since this is a relative term. It is unclear how much sugar is in the nutrient medium.

Applicant's arguments filed December 27, 2005 have been fully considered but they are not persuasive.

Applicant urges that the term "more than about" is not indefinite because infringement of the claim can be determined by measuring the amount of galactose-containing compound (response page 9).

This is not found persuasive because "more than about" makes the recitation "1%" meaningless, percentage less than and more than 1% are encompassed.

10. Claim 39 recites the limitation "the embryogenic culture" in line 1. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1, 5-8, 12, 16-22, 43 and 44 rejected under 35 U.S.C. 102(b) as being anticipated by von Arnold (J. Plant. Physiol., 1987, vol. 128, pp. 233-244).

The claims are drawn to a method of reproducing *Picea* from the *Pinaceae* family by somatic embryogenesis, wherein the galactose (monosaccharide) is the carbon source supplemented with additional sugar (sucrose) and the addition of auxin and cytokinin in the gelled nutrient medium and then transferring to a maturation medium to produce embryos suitable for germination.

Von Arnold discloses that formation of embryogenic callus occurred when grown in a gelled basal medium containing 30mM sucrose in which the induction medium was supplemented with between "about 1% and about 6%" galactose (monosaccharide) auxin and cytokinin (pages 234-235 and Table 5). The percentage of sugar in the nutrient medium as claimed by the Applicants is meaningless because the phrase "less than about" is unclear. Von Arnold discloses that zygotic embryos of *Picea abies* were able to form embryogenic callus and then transferred to cytokinin medium, which eventually produced plantlets (abstract and page 241, 2nd full paragraph).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 1, 4-8, 12, 14, 16-22, and 43-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over von Arnold (J. Plant. Physiol., 1987, vol. 128, pp. 233-244) in view of Schuller et al (IDS dated October 25, 2004, Plant Cell Reports, 1993, vol.12, no. 4, pp. 199-202) and further in view of Find, U.S. Patent No. 6,897,065.

The claims are drawn to a method of reproducing conifers by somatic embryogenesis, wherein the sugar, galactose or lactose is the carbon source supplemented with additional sugar in the induction, proliferation and prematuration media and the addition of auxin and cytokinin in the nutrient medium. Moreover, abscisic acid is added at the prematuration step.

The teachings of von Arnold are discussed above.

Von Arnold does not teach reproducing somatic embryogenesis with abscisic acid in the prematuration step and the use of lactose as a carbon source.

Schuller et al teaches that lactose, a disaccharide, was a superior carbon source in the maturation stage of *Abies alba* (abstract and page 202, col. 2). Further proliferation of somatic embryos occurred when abscisic acid was supplemented to the media (page 200, col. 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of von Arnold by supplementing the prematuration step with abscisic acid to reproduce somatic embryogenesis in conifer as shown by Schuller in light of the fact that abscisic acid promotes maturation in conifers (Find col. 5, lines 36-38). Find also notes that galactose and lactose are other carbon sources that can be substituted (col. 4, lines 5-7).

Thus, the invention as a whole was clearly *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

13. Claims 1, 4-9, 12, 16-23, 26-29, 32, and 36-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over von Arnold (J. Plant. Physiol., 1987, vol. 128, pp. 233-244) in view of Vuke et al (Plant Cell Reports, 1987, 6(2), pp. 153-156).

The claims are drawn to a method of reproducing *Pinus taeda* by somatic embryogenesis, wherein the galactose or lactose is the carbon source supplemented with additional.

The teachings of von Arnold are discussed above.

Von Arnold does not teach the reproduction of somatic embryogenesis with *Pinus taeda*.

Vuke et al teaches callus of *Pinus taeda* was able to grow in media supplemented with galactose or lactose (Table 1). The basal medium for the pine callus initiation and stock culture

maintenance contained napthyeneacetic (NAA) and benzyl amino purine (BAP) (page 153, col. 2).

It would have been obvious to one of ordinary skill in the art to produce somatic embryos of *Pinus* species as shown by Vuke by the method steps of reproducing somatic embryogenesis in conifers as taught by von Arnold. One of skill in the art would have been motivated to do so because one would have wanted to obtain high frequency of embryogenesis in the economically important loblolly pines. In addition, one of skill in the art would have been motivated to use lactose as the galactose-containing carbohydrate because Vuke at al taught that lactose is effective for supporting growth of conifers in tissue culture (see Table 1). Thus, the invention as a whole was clearly *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

14. Claims 1, 5-12, 14, 16-23, 27-34, 36-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over von Arnold (J. Plant. Physiol., 1987, vol. 128, pp. 233-244) in view of Uddin (U.S. Patent No. 5,187,092).

The claims are drawn to a method of reproducing *Pinus taeda*, *Pseudotsuga menziesii* and *Pinus radiata* by somatic embryogenesis, wherein the galactose-containing compound is the main carbon source supplemented with additional sugar and the addition of auxin and cytokinin in the induction, proliferation and prematuration media. Moreover abscisic acid is added to the prematuration step.

The teaching of von Arnold is discussed above.

Von Arnold does not specifically teach the method of reproducing somatic embryogenesis in the *Pinus* and *Pseudotsuga* genera.

Uddin teaches a method of reproducing somatic embryogenesis in *Pinus taeda*, *Pseudotsuga menziesii* and *Pinus radiata* with glucose a monosaccharide or maltose a disaccharide in amount of 3-6% as the carbon source in the plant tissue culture media supplemented with abscisic acid (column 3, line 26 through column 4, line 50 and Table 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to reproduce somatic embryogenesis in *Pinus* and *Pseudotsuga* species as taught by Uddin by using the culture medium taught by von Arnold. One skill in the art would have been motivated to apply the method of somatic embryogenesis as taught by von Arnold to loblolly pine, Monterey pine and Douglas fir because of their economic importance. Thus, the invention as a whole was clearly *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

### *Conclusion*

No claims are allowed.

### *Correspondence*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to June Hwu whose telephone number is (571) 272-0977. The Examiner can normally be reached Monday through Thursday from 6:00 a.m. to 4:30 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Anne Marie Grunberg, can be reached on (571) 272-0975. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

June Hwu
March 20, 2006